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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,681	09/19/2003	Demetri Psaltis	P397-US	4072
72932	7590	01/21/2010		
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EXAMINER				
LAMB, CHRISTOPHER RAY				
ART UNIT		PAPER NUMBER		
2627				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/664,681

**Applicant(s)**

PSALTIS ET AL.

**Examiner**

CHRISTOPHER R. LAMB

**Art Unit**

2627

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-6,10 and 11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,10 and 11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko et al. (US 6,291,132) in view of Bawendi et al. (US 6,774,361), and further in view of Fuller et al. ("Ink-Jet Printed Nanoparticle Microelectromechanical Systems," Journal of Microelectromechanical Systems, Vol. 11, No. 1, February 2002, disclosed in IDS).

Regarding claim 1:

Glushko discloses:

A method of storing data comprising:

placing a plurality of fluorescent elements at each of a plurality of data pit locations on a rotating data storage medium to represent data (column 12, lines 35-50);  
exciting said fluorescent elements at each location by making them fluoresce (column 12, line 50 to column 13, line 5);

measuring said fluorescence of said fluorescent elements at each location to identify presence and absence (column 13, line 45-65).

Glushko does not disclose:

(A) wherein said fluorescent elements are:

nanometer beads filled with nanometer sized particles, the nanometer sized particles providing colors to the nanometer beads;

where it is the colors within said beads that are excited and the presence and absence of said colors that is identified.

(B) wherein the nanometer beads are placed using inkjet technology.

Regarding (A):

Bawendi discloses:

fluorescent elements that are nanometer beads filled with nanometer sized particles (column 14, lines 15-50), the nanometer sized particles providing colors to the nanometer beads (column 6, lines 25-65);

where it is the colors within said beads that are excited and the presence and absence of said colors that is identified (e.g., column 5, lines 45-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in Glushko wherein the fluorescent elements are nanometer beads filled with nanometer sized particles, the nanometer sized particles providing color to the nanometer beads, as taught by Bawendi, where it is the colors within said beads that are excited and the presence and absence of said colors that is identified.

The rationale is as follows:

Both Glushko and Bawendi are directed to using fluorescent materials to record information.

Glushko discloses using fluorescent dye to record information.

Bawendi specifically discusses using fluorescent dyes to store information (column 3, lines 5-15) and discloses that quantum dots are superior (column 3, lines 5-40).

One of ordinary skill could have combined the known improvement taught by Bawendi with the disclosure of Glushko and achieved predictable results.

Regarding (B):

Glushko in view of Bawendi does not disclose wherein the nanometer beads are placed using inkjet technology.

Fuller discloses wherein nanometer beads are placed using inkjet technology (page 54: last two paragraphs).

It would have been obvious to one of ordinary skill in the art to include in Glushko in view of Bawendi wherein the nanometer beads are placed using inkjet technology.

The rationale is as follows:

Fuller demonstrates that inkjet technology is a known method for depositing nanometer beads. Fuller discloses that is advantageous (page 54).

One of ordinary skill could have combined the teaching of Fuller with that of Glushko in view of Bawendi and achieved predictable results.

Regarding claim 3:

Glushko in view of Bawendi, and further in view of Fuller, discloses:  
wherein said nanometer sized particles are nanometer sized fluorescent particles (taught by Bawendi as discussed above).

Regarding claim 4:

Glushko in view of Bawendi, and further in view of Fuller, discloses:  
wherein said nanometer sized particles comprise quantum dots (taught by Bawendi as discussed above).

Regarding claim 5:

Glushko in view of Bawendi, and further in view of Fuller, does not explicitly disclose:

wherein said quantum dots are made up of red, blue, and green color.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to include in Glushko in view of Bawendi, and further in view of Fuller, wherein said quantum dots are made up of red, blue, and green colors.

The rationale is as follows:

Bawendi teaches that the quantum dots are made up of multiple colors (each "discrete emission" of column 6, lines 45-55 is a separate color).

There is a finite set of colors, of which red, blue and green are prominent examples. One of ordinary skill could have pursued the known potential solutions and chosen red, blue, and green with a reasonable expectation of success.

Regarding claim 6:

Glushko in view of Bawendi, and further in view of Fuller, discloses:  
wherein said quantum dots are made of a plurality of shades of a color (column 6, lines 45-55: if there may be twenty separate discrete emissions at least some must be a plurality of shades of a color, since there are less than twenty major colors).

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko in view of Bawendi, and further in view of Fuller, as applied to claim 1 above, and further in view of Metz (US 5,166,813).

Regarding claim 10:

Glushko in view of Bawendi, and further in view of Fuller, discloses a method for storing data as discussed above in the rejection of claim 1.

Glushko in view of Bawendi, and further in view of Fuller, does not disclose "wherein a HSMF is used for dispersing collimated fluorescent light on a spectrally sensitive component."

Metz discloses that when detecting fluorescence, a holographic multi-spectral filter is used for dispersing collimated fluorescent light on a spectrally sensitive component (the abstract discloses the use of a holographic filter; Fig. 1 depicts the light impacting the spectrally sensitive component; column 12, lines 40-50 discloses that the hologram can be multi-spectral: that is, it transmits more than one wavelength). Metz discloses that a holographic filter is more efficient (column 13, lines 1-15).

It would have been obvious to one of ordinary skill at the time of the invention to include in Glushko in view of Bawendi, and further in view of Fuller a holographic multi-spectral filter as taught by Metz.

The combination would have been predictable to one of ordinary skill in the art; the motivation would have been to be more efficient.

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glushko in view of Bawendi, and further in view of Wenzel ("Shaping nanoparticles and their

optical spectra with photons," Applied Physics B, pages 513-517, October 20<sup>th</sup>, 1999; cited in applicant's specification).

Regarding claim 11:

This claim is identical to claim 1 except that the nanometer beads are placed "using laser-induced technology."

As above, the base reference Glushko does not teach the nanometer beads or the means of placing them.

The nanometer beads are taught by Bawendi; the analysis was discussed in detail in the rejection of claim 1.

Regarding the means of placing the beads:

Glushko in view of Bawendi does not disclose wherein they are placed "using laser-induced technology."

Wenzel discloses using laser-induced technology to place quantum dots (e.g., Conclusions, page 516).

It would have been obvious to one of ordinary skill in the art to include in Glushko in view of Bawendi wherein the nanometer beads are placed using laser-induced technology.

The rationale is as follows:

Wenzel teaches a known technique to place nanoparticles.

One of ordinary skill in the art could have combined it with the teaching of Glushko and Bawendi and achieved predictable results.

***Response to Arguments***



5. Applicant's arguments filed December 1<sup>st</sup>, 2009 have been fully considered but they are not persuasive.

Applicant's first argument is that Glushko and Bawendi "teach against" the combination. Here applicant argues that column 3, lines 4-12 of Bawendi contain "a clear teaching against fluorescent beads," and that likewise column 15, line 49 does so.

Respectfully, applicant is not considering the context of these cited sections. In column 3, lines 4-12, Bawendi is discussing the failures of a prior art fluorescent system. Here Bawendi is not teaching against fluorescence in general, but simply the way the prior art system worked. Specifically, Bawendi is saying that the dyes used in the prior art have problems, and then in Bawendi's own invention, Bawendi discloses using quantum dots that do not have these problems.

Likewise in column 15, line 49. Applicant quoted where Bawendi says the system "is in contrast to fluorescently labeled probes," but it actually reads "is in contrast to fluorescently labeled probes **used in the existing methods.**" Bawendi is not teaching against fluorescent probes in general but simply stating that Bawendi's fluorescent method is superior to the existing methods.

Bawendi discloses that using quantum dots in a fluorescent system gives you better results than you got in previous fluorescent systems. If anything, the sections applicant quoted strengthen the argument for the combination, because it indicates that the quantum dots taught by Bawendi would be better than the fluorescent system used in Glushko alone.

For this reason applicant's argument is not persuasive. It actually supports the combination used in the rejection.

Applicant's second argument is that the "combination of Bawendi and Glushko would frustrate the principle of operation of Bawendi."

Here applicant argues that Bawendi correlates the emissions of "a collection of quantum dots," and that "therefore, there is no teaching, in Bawendi, that each bead can be seen as an entity separated by the others."

There are a number of problems with this argument. First, the base reference, Glushko, already places fluorescent elements at individual locations on the medium. Bawendi is only relied upon to replace the fluorescent materials used by Glushko with the superior quantum dots. Therefore it doesn't matter whether Bawendi detects separate entities or not as long as the materials taught by Bawendi could be placed as the fluorescent elements are already used in Glushko. It's clear that they could be, especially given the contribution of Fuller, which teaches how to place such particles.

Secondly, applicant's own invention doesn't detect individual quantum dots. For example, see applicant's Fig. 1, where clearly there is a collection of quantum dots in each data location. In other words, the application correlates the emissions of a collection of quantum dots too, doing essentially the same thing that Bawendi teaches. Applicant's argument is a bit misleading because it makes it sound as though Bawendi must teach separately identifying the emission of each quantum dot, whereas in reality a combination that teaches identification of the spectrum of a collection of quantum dots

at each location not only meets the claim language but is essentially identical to applicant's disclosed invention.

***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **CHRISTOPHER R. LAMB** whose telephone number is (571)272-5264. The examiner can normally be reached on 9:00 AM to 5:30 PM Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher R Lamb/  
Examiner, Art Unit 2627